

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Claus Biller et al.
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Title: Bag with Lateral Folds
Examiner: Peter N. Helvey
Art Unit: 3782

Commissioner for Patents
Alexandria, VA 22313-1450

DECLARATION PURSUANT TO 37 CFR 1.132

I, Johannes Wedi, residing at Konrad-Adenauer-Str. 15, 48252 Emsdetten, Germany, have been employed for more than 20 years by Bischof + Klein GmbH & Co. KG, Rahestr. 47, 49525 Lengerich, Germany, assignee of the instant application. During this time, I have been working in research and development of bags and similar containers for packaging. I am inventor or co-inventor of several patents and patent applications in this field assigned to Bischof + Klein GmbH & Co. KG. Currently, I am director of research and development on bags and containers from plastic films at Bischof + Klein GmbH & Co. KG. I am thus familiar with all aspects and design considerations as well as manufacturing problems relating to such bags or containers. I am also familiar with the research and development that went into the gusseted bags according to original German utility model 20 2004 006 857.5 and instant US patent application 10/599,204 that is based on this German utility model. Because of my knowledge and expertise in this technical field, I am able to explain and discuss the technical aspects relating to the subject matter of the instant application in relation to the cited references US 2004/0258332 (Totani) and the two references US 2001/0051008 (Wedi et al.) and US 2003/0210837 (Wedi et al.) of which I am a co-

inventor.

All of the cited references relate to gusseted bags. Prior to use, such gusseted bags are stored and transported in the unfilled state with their front wall and rear wall lying flat and their gussets folded inward and lying between the front wall and the rear wall. When such bags are filled, the bags assume a rectangular cross-section as their gussets are unfolded. The bottom of the bags can also have a rectangular shape; this requires only a transversely extending bottom seam. When the bags are filled at the top, such a bottom seam is already applied to the bag blank. However, it is technically possible to apply such a bottom seam after filling.

The basic scheme for manufacturing such bags is based on two main walls (front wall and rear wall) being provided. Lateral walls in the form of gusseted sidewalls are placed between these two main walls and have a length extending across the entire length of the two main walls, respectively. The gusseted sidewalls are connected (fused or sealed) by lateral seams across their entire length to the lateral edges of the main walls. The seams can be created by passing the stacked layers through rollers that apply the appropriate sealing (fusing) temperature. It is also possible to employ sealing shoes (stamps) that are heated to the required sealing (fusing) temperature.

In the sequence of machine-based manufacture, the bottom and top seams can be applied subsequently by transversely positioned sealing shoes. When the top or bottom seams are to be applied by sealing rollers, a section of the endless plastic films that pass continuously through the machine and constitute the front and rear walls of the bag is separated from the endless plastic films so as to have a length that matches the desired height of the bag; this section is then moved in transverse direction within the machine (transverse to the direction of movement of the plastic films).

The basic shape of a gusseted bag of this conventional type is illustrated in US 2004/025833 (Totani) in Figs. 18 to 20 and even better in US 2003/0210837 (Wedi et al.) where continuous gussets (extending all the way from top to bottom of the bag), continuous lateral seams as well as transversely extending top and bottom seams are shown.

These standard bag forms can be produced easily with a single pass through a manufacturing machine when two congruent plastic films with matching width are

supplied continuously to the machine to produce the two main walls (front and rear walls) and when gusseted sidewalls as lateral walls are laterally inserted between the two plastic films and longitudinal seams for connecting the main walls and the gusseted sidewalls are applied in the lengthwise direction along the edges of the two plastic films with interposed gussets. Subsequently, the transverse seams are applied at top and bottom as needed; optionally, recloseable closures (zippers) are fused to the top end (US 2003/0210837).

However, when it is desired that the gussets end below the top area (at a spacing from the top) so as not to extend all the way into the top area so that the gussets do not present an obstacle with respect to access to the removal opening of the bag and removal of contents from the bag, the gussets must be closed at their upper end so that the contents cannot spill. This can be done by various measures.

US 2004/025833 (Totani) proposes that the upper edges of the shortened gussets are folded along a slanted fold line relative to the longitudinal edges of the bag so that the upper edges then coincide with the outer lateral edges of the bag and face outwardly at the side of the bag (Figs. 1, 2, 3, 4 of US 2004/0258332). This is in principle an elegant solution: The gussets are folded before insertion between the front and back walls at the upper end in a triangular shape (Fig. 2) and can then be sealed together with the longitudinal seams 6 at the lateral edges 2 in the same way as is done for continuously supplied gusseted sidewalls. The gussets are then closed off relative to the bag interior so that no openings between the exterior of the bag and the interior of the bag exist.

However, the gussets in the folded triangle area have small slots or openings that allow passage through the gusseted sidewall halves downwardly and outwardly as a result of the slanted fold line. Even though this provides no connection to the interior of the bag, this is still an undesirable passage and the bag is not completely "closed" along its outer contour. This passage or opening is caused because the plastic film of the gussets is sealable only relative to the inner side of the bag while the exterior sides of the gussets that are folded over onto each other are of a material that cannot be sealed so that this area remains unsealed and "open". The bag thus appears to be open and unsealed along the lateral seam in the area of the folded-over gussets. This is

not acceptable to the customer even when the lateral opening in this folded-over area is divided into two portions by providing the cutout 17 so that by means of this cutout 17 an additional sealed portion is formed. The cited reference proposes a bag with closed lateral seams where, however, the folded-over gusset area within the lateral seam appears to be open and thus flawed. An additional problem of the seams 6 in this reference is that the area to be sealed has several stacked layers and a reliable and seal-tight sealing action of multiple layers cannot be guaranteed.

US 2001/0051008 discloses that the gussets are also prepared in such a way that they can be processed on a conventional machine in a single pass in the same way as continuously extending top-to-bottom gussets so that the seams (15, 16) between the main walls 4, 5 and the gussets 7 (Fig. 1 of US 2001/0051008) are produced in one pass through a machine. However, the gussets are not folded as in US 2004/0025833 such that their open edges are positioned between the lateral seams (15, 16) but instead their open edges have been sealed in outward direction so that they are closed off prior to the sealing action that creates the seams 15, 16. This closure requires a separate step in contrast to US 2004/0025833 in which the upper areas (17) are folded and then sealed together. The sealing action of the folded-over areas (17) fuses all stacked layers flat onto each other only when the plastic film can be sealed at both faces (both faces are of fusible material). When the film is fusible only at one face, i.e., the inwardly facing side that is facing the interior of the bag, of the two layers in the folded-over area (17) only one layer is fused with the area of the gusset on which it is resting. The upper layer is not fused to a flat seam. However, since the sealable or fusible layer (e.g. PE) that is positioned on the inner side of the bag is conventionally made so thick that the (PE) material upon sealing flows past the free edges of the gussets, the free edges upon sealing of the upper areas (17) were coated and covered by the material and thus also sealed in accordance with the proposal of US 2001/0058001.

In recent years, however, research and development in connection with plastic films for producing the bags in question has produced plastic films of much reduced thickness, even in case of multi-layer films, so that closure of the gussets as proposed in US 2001/0051008 in case of films that are sealable only at one face is no longer

feasible as there is not enough material for flowing past the open edge and sealing the open edges.

The solution that is now proposed according to instant application 10/599,204 deviates from the well-known principle that the front wall, the rear wall, and the gusset walls are to be sealed only with seams at the edges, i.e., the lateral seams, the top seam and the bottom seam (and optionally also the sealed-in reclosure devices). The bag according to the present invention requires an inwardly positioned large flat seal between the upper folded area of the gussets and one of the main walls. Therefore, the proposed bag of the instant application cannot be viewed as a modification of US 2004/0258332 and/or US 2003/0218374 or US 2001/0051008.

In the present invention, the upper areas of the gussets are first folded like a triangle in such a way that the free edges of the triangle are positioned within the bag (and not as in US 2004/0258332 along the lateral edges). This folding-over action corresponds to the preparation as in US 2001/0051008. The most important feature in connection with the present invention is however that the gussets are not to be completed simply by sealing it within the lateral seams (6, 7) between the walls 1 and 2. Instead, the front wall or the back wall that is provided with a sealable inner layer (facing the interior of the bag) is used in order to position the folded-over triangle of the gussets in flat arrangement in the stacked layers and primarily to close seal-tightly the free edge (17) of this triangle. The slanted upper edges (13) of the folded-over gussets do not project into the interior of the bag or into its removal opening. The primary effect is however the sealing action of the upper gusset edges and thus a seal-tight closure of the bag.

The manufacturing process of the bag-making machine must be adapted in this connection because the gussets with their upper areas must be sealed or fused flat onto the front wall or back wall (cross-hatched area in Fig. 1) before the lateral seams can be sealed.

This solution is not an obvious one. It requires breaking with the basic principle of prior art bags produced by machine manufacture according to which the bag is to be produced in that the front wall and rear wall and the interposed gussets are to be connected by longitudinal sealing seams and top and bottom seams are to be provided

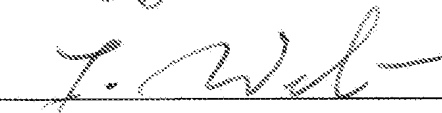
to close the bag. In the present invention, the gussets are sealed by a large flat seal (cross-hatched area in Fig. 1) in the area of the folded-over triangle (16) to one of the front or rear wall (2) so that the gussets are not only sealed by means of the lateral seams (6 and 7) but also by the large flat sealed area (16) relative to one of the front or rear wall (2).

All prior art proposals have been limited to sealing of the gussets by means of the conventional longitudinal and transverse seams; this approach has provided only flawed results in the form of incompletely sealed bags.

The solution that is proposed with the present invention is based on a different technical principle and leads to a seal-tight bag that has a perfect (completely sealed - no openings) outer appearance and whose interior is provided in the area of the bag opening with slanted upper ends of the gussets that do not interfere with access to the contents of the bag.

I herewith declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true; and that I am warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 USC 1001) and may jeopardize the validity of the application or any patent issuing thereon.

Signed this 28 day of June 2011,



(signature)

Johannes Wedi

(printed name)